COMPLETE LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A heat transfer system adapted for operation in a heating mode without periodic operation in a defrost cycle, said system comprising:

a heat exchanger ~~component~~ including a ~~having a finned~~ heat exchange surface having at least one fin affixed to said heat exchange surface, ~~immersed~~ said heat exchanger adapted for immersion in a moisture laden atmosphere, said heat exchanger adapted for operation in said heating mode whereby a working fluid having a temperature less than the freezing point of water in said moisture laden atmosphere is flowed through the heat exchanger so as to promote the adherence of frozen moisture to the heat exchange surface; and

a non-stick coating applied to the heat exchange surface including at least one said fin, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface.

2. (cancelled)

3. (currently amended) The heat transfer system of claim 1 wherein the heat exchanger ~~component~~ comprises ~~fluid transfer~~ refrigerant tubing having heat transfer fins in thermal contact with the ~~fluid transfer~~ refrigerant tubing.

4. (currently amended) ~~The heat transfer system of claim 3~~ A heat transfer system comprising:

a heat exchange component having a finned heat exchange surface adapted for immersion in a moisture laden atmosphere wherein, the heat exchange component comprises fluid transfer tubing having heat transfer fins in thermal contact with the fluid transfer tubing; and

a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface,

wherein the fluid transfer tubing and heat transfer fins are oriented to promote gravity flow of frozen moisture away from the heat exchange component.

5. (currently amended) ~~The heat transfer system of claim 1 further comprising~~ A heat transfer system comprising:

a heat exchange component having a finned heat exchange surface adapted for immersion in a moisture laden atmosphere and a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface; and

a protective shell positioned around the heat exchange component, the protective shell also having non-stick coating adapted to inhibit the adherence of frozen moisture to the shell.

6. (previously presented) A heat transfer system comprising:

a heat exchange component having a heat exchange surface;

a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface; and

a protective shell positioned around the heat exchange component, the protective shell also having non-stick coating adapted to inhibit the adherence of frozen moisture to the shell,

wherein the protective shell is shaped to enhance convection air flows through the shell and around the heat exchange component.

7. (previously presented) The heat transfer system of claim 6 wherein the protective shell further comprises outwardly flared top and bottom portions.

8. (previously presented) A heat transfer system comprising:

a heat exchange component having a heat exchange surface;

a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface; and

a fan positioned proximate the heat exchange component.

9. (original) The heat transfer system of claim 8 wherein exposed surfaces of the fan are coated with a non-stick coating.

10. (previously presented) A heat transfer system comprising:

a heat exchange component having a heat exchange surface;

a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface; and

a vibrator operatively connected to the heat exchange component to promote release of frozen moisture from the heat exchange surface.

11. (original) The heat transfer system of claim 10 wherein exposed surfaces of the vibrator are coated with a non-stick coating.

12. (previously presented) A heat transfer system comprising:

a heat exchange component having a heat exchange surface;

a non-stick coating applied to the heat exchange surface, the non-stick coating adapted to inhibit adherence of frozen moisture to the heat exchange surface; and

a base positioned below the heat exchange component, the base sloped downwardly and outwardly to direct frozen moisture accumulations away from the heat exchange component, the base provided with a non-stick coating adapted to inhibit adherence of frozen moisture.

13. (currently amended) In a heat exchange system such as an air-source heat pump system, an open loop or closed loop water-source heat pump system, a direct expansion heat pump system, or an evaporative cooling system, ~~the heat exchange system having at least one heat exchange component with exposed heat transfer surfaces~~ the heat exchange system comprising a refrigerant flowing through a heat exchanger having at least one finned tubing segment, each tubing segment having a finned heat transfer surface, said heat exchanger adapted for immersion in a

moisture laden atmosphere such that operation of said heat exchange system in a heating mode tends to cause condensation of frozen moisture in the vicinity of the finned heat transfer surface, an improvement comprising a non-stick coating applied to the finned heat transfer surfaces so as to inhibit adherence of frozen moisture.

14. (currently amended) A method of inhibiting ice accumulation on an air-exposed heat transfer surface of a heat exchanger in a heat exchange system comprising the steps of:

~~(a) providing a finned heat transfer tubing having a heat transfer surface;~~

~~(b) shaping the heat transfer tubing to form an air-exposed heat exchanger adapted for use in a heat exchange system such as an air-source heat pump system, an open loop or closed loop water-source heat pump system, a direct expansion heat pump system, or an evaporative cooling system;~~

~~(c) coating the heat transfer surfaces with a non-stick material~~.

(a) providing a heat exchange system comprising a refrigerant flowing through a heat exchanger having at least one finned tubing segment, each tubing segment having a finned heat transfer surface, said heat exchanger adapted for immersion in a moisture laden atmosphere such that operation of said heat exchange system in a heating mode tends to cause condensation of frozen moisture in the vicinity of the finned heat transfer surface;

(b) coating at least one heat transfer surface with a non-stick material so as to inhibit adherence of frozen moisture.

15. (previously presented) The method of claim 14 wherein the non-stick material comprises PTFE.

16. (previously presented) A method of inhibiting ice accumulation on an exposed heat transfer surface of a heat exchange component in a heat exchange system comprising coating the heat transfer surface with a fluoropolymer dip coating.

17. (previously presented) The method of claim 14 wherein the non-stick material comprises a triazine-dithiol derivative.

18. (previously presented) An atmospheric heat exchange system comprising:

a fluid transfer tubing adapted for immersion in a moisture laden atmosphere, the fluid transfer tubing formed into a heat exchanger array having fluid transfer tubing segments with generally non-horizontal slopes so as to remove moisture and frozen moisture by gravity flow, wherein the fluid transfer tubing segments are disposed within the heat exchanger array so as to reduce the amount of moisture or frozen moisture shed from any fluid transfer tubing segment that falls onto another fluid transfer tubing segment;

a refrigerant fluid flowed into the heat exchanger array, the refrigerant fluid having a temperature at or below the freezing temperature of moisture carried by the atmosphere; and

a non-stick coating applied to the fluid transfer tubing, the non-stick coating adapted to inhibit adherence of moisture and frozen moisture to the fluid transfer tubing.

19. (previously presented) The heat exchanger of claim 18 further comprising:

heat transfer fins in thermal contact with the fluid transfer tubing, the non-stick coating further applied to the heat transfer fins.

20. (previously presented) The heat exchanger of claim 19 wherein the heat transfer fins are oriented so as to remove moisture and frozen moisture by gravity flow in a manner that minimizes the shedding of moisture and frozen moisture from one portion of the fluid transfer tubing onto another portion of the fluid transfer tubing.

21. (previously presented) The heat exchanger of claim 20 wherein the heat exchanger array comprises a generally helical spiral of fluid transfer tubing oriented along a generally horizontal axis.

22. (new) In a refrigerant system having at least one refrigerant coil, wherein operation of said refrigerant system includes transferring heat from a moisture laden atmosphere to a chilled refrigerant flowed through said refrigerant coil, said refrigerant sufficiently chilled so as to promote accumulation of frozen moisture upon said refrigerant coil, an improvement comprising a non-stick coating applied to the refrigerant coil so as to generally inhibit accumulation of frozen moisture upon said refrigerant coil.

23. (new) A heat transfer system comprising a heat exchange component having a heat exchange surface,

wherein, said heat transfer system is adapted for selected operation in a heating mode, said operation in a heating mode including a period of operation in a heating cycle,

wherein, operation in said heating cycle includes transferring heat from a moisture laden atmosphere to a chilled working fluid flowed through said heat exchange component, operation in said heating cycle tending to promote accumulation of frozen moisture upon said finned heat exchange surface,

wherein, an accumulation of frozen moisture upon said heat exchange surface inhibits heating cycle operation, and

wherein, said heating and cooling system further comprises a fluoropolymer material applied to the heat exchange surface, the fluoropolymer material creating a non-stick heat exchange surface that sheds frozen moisture whereby said heating system operating in the heating mode will generally operate in heating cycle operation without accumulation of frozen moisture upon the heat exchange surface.

24. (new) A heat transfer system comprising:

a refrigerant;

a heat exchanger having a heat exchange surface, said refrigerant being flowed through said heat exchanger; and

a fluoropolymer material applied to said heat exchange surface,

wherein, said heat transfer system is adapted for selected operation in a heating mode, said operation in a heating mode including periodic heating cycle operation, such heating cycle operation including transferring heat from a moisture laden atmosphere to said refrigerant, said refrigerant being chilled sufficiently to generally promote accumulation of frozen moisture upon said heat exchange surface,

wherein, an accumulation of frozen moisture upon said heat exchange surface inhibits heating cycle operation,

wherein, said operation in a heating mode further includes such periods of defrost cycle operation to remove such frozen moisture as may accumulate during a preceding period of heating cycle operation, such defrost cycle operation precluding heating cycle operation, and

wherein, said fluoropolymer material provides a non-stick coating creating a non-stick surface such that frozen moisture is generally prevented from adhering to the heat exchange surface whereby said heating system operating in the heating mode will generally operate in heating cycle operation without accumulation of frozen moisture upon the heat exchange surface and thus generally operate without defrost cycle operation.